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Published online: 07 Jun 2021.

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Are Dividends All for Rewarding Investors? Evidence from Payouts Induced by Return on Equity Targets

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ABSTRACT

Dividends have long been perceived as a way for firms to reward investors. However, managers are likely to inflate return on equity (ROE) by paying out dividends because doing so reduces owners' equity. We utilise performance-vesting equity incentive plans that adopt ROE as the performance measure to examine this possibility. We find that firms with pre-dividend ROE slightly below the vesting target are more likely to pay dividends and are associated with larger payout ratios than others. Because weighted average ROE's computation assigns more weight to earlier paid dividends, we also find that these firms are more likely to pay dividends earlier and have larger time-weighted payout ratios. Further investigations show that dividends substitute for accrual and real earnings management in inflating ROE. Finally, we obtain evidence that ROE-induced dividends reduce firm value in the long run. Overall, our evidence reveals that dividends may be induced by managers' incentives to meet ROE targets. This phenomenon deserves more attention, as nowadays regulators often take an exclusively positive view of dividends.

1. Introduction

Dividends are a crucial way for investors to earn returns. Despite the 'low dividend anomaly' and prevalence of non-distribution stocks in the earliest stages of the Chinese capital market (Li, 1999), firms' willingness to pay out dividends has increased significantly over the years. In 2017, about 80% of listed companies in China paid out dividends, amounting to about 1.07 trillion yuan. In 2018, China's listed companies paid out 1.15 trillion yuan in dividends.[1] These changes could be the outcomes of regulations like the semi-mandatory dividend policy, linking refinancing eligibility to dividends, and the requirement that listed companies make dividend plans/commitments in their articles of association. To further reward and encourage listed companies to pay dividends, Shanghai and Shenzhen stock exchanges and China Association for Public Companies

even published the 'List of Highest Returns of Listed Companies' based on the total dividends and the dividend payout ratio.[2] Because of these persistent advocacies of dividends, the notion that company pays back investors by dividends is deeply rooted in investors' minds. However, it is worth asking whether paying dividends is essentially for rewarding investors.

In the recent dispute over a 'lucrative payout' by Huabao (ticker: SZ300741), the company justified its dividend policy in its reply to the Shenzhen Stock Exchange's comment letter by arguing that 'dividends increase the return on equity and thus the value of the company.'[3] By reducing net assets, dividends naturally bring a larger ROE.[4] However, this is just a mechanical application of the ROE formula, rather than a real improvement in the company's core profitability, let alone the creation of corporate value. While Huabao's response failed to justify its huge payout, its argument suggests that listed firms have the motivations to boost ROE by paying dividends, which should raise concerns among both regulators and investors.

ROE is a critical financial indicator in China's capital market. China Securities Regulatory Commission (CSRC) has used ROE as a performance threshold when regulating the firm's rights offering, public seasonal offering, convertible bond issuance, so on and so forth. Only listed companies with a weighted average ROE of at least 6% for the last three years are qualified for refinancing.[5] Besides, listed companies must disclose their ROE in the annual report's first financial table. ROE is also a key indicator for investors to pick stocks. Value investors tend to pick the company that generates high ROE over the long term.[6] Considering investors' attention and regulators' requirements, we conjecture that managers would inflate ROE by paying dividends.

In this paper, we explore this issue in the context of China's listed companies' performance-vesting equity incentive plans. Weighted average ROE is widely used as a performance measure in the listed companies' performance-vesting equity incentive

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[2]For details, please refer to the news report entitled 'China Association for Public Companies Released a List of Cash Dividends of A-Share Listed Companies with Shanghai and Shenzhen Stock Exchanges,' published on 20 July 2018, http://www.capco.org.cn/content/33472.shtml.

[3]For details, please refer to the 'Reply to the Comment Letter from Shenzhen Stock Exchange by Huabao Flavour Co., Ltd.'

[4]While reducing owners' equity, dividends also potentially reduce earnings because of the 'opportunity income' of dividend re-investment. We define 'opportunity income' in a similar vein as 'opportunity cost', i.e. the potential gains owed to a missed opportunity. The opportunity income of a dividend can be estimated as 'dividend amount × return on dividend investment × (1- effective corporate income tax rate).' The average effective corporate income tax rate for listed companies in our paper is 14.70%. If we use the average yield of China's one-year treasury bonds from 2006 to 2016 as the proxy for the investment return, the return rate is 2.60%. If we use China's average annual after production tax return on capital from 2006 to 2013, estimated by Bai and Zhang (2014), the investment return is 8.84%. In sum, one dividend reduces earnings by only 2.22% or 7.54%, much less than the magnitude by which owners' equity is reduced (100%). In other words, for every 1 yuan of owners' equity reduced by a dividend, the corresponding decline in earnings will be only 0.0222–0.0754 yuan. This suggests that dividends impose a much smaller impact on the numerator of return on equity (ROE) than on the denominator; thus, issuing dividends always boost ROE. For brevity, we do not discuss the effect of dividends on earnings in the main text; however, this effect is accounted for in all empirical tests.

[5]For details, please refer to policy documents by the CSRC, including the *Management of Securities Issuance by Listed Companies (2008)*, and the *Guidelines on the Content and Format of Information Disclosure by Companies Publicly Issuing Securities No. 2: Content and Format of Annual Reports*. It should be noted that the denominator of ordinary ROE is the average of the owners' equity at the beginning/end of the period, while the denominator of weighted average ROE takes into account the specific time when the change of owners' equity happens (e.g. for the same amount of dividends, implementation in May (weighting 7/12) has a greater impact on owner's equity than implementation in July (weighting 5/12)). We abbreviate 'weighted average ROE' as ROE in this paper unless there are ambiguities.

[6]According to Forbes report 'Warren Buffett's Investing Formula Revealed,' ROE is the most used indicator in Buffett's investment. Frazzini et al. (2018) also find that Buffett's excess returns (Alpha) can be explained by the Quality-Minus-Junk factor, where the level and the change of ROE are crucial components.

plans in China. According to the CSRC's regulation (*Regulations for the Equity Incentives of Listed Companies*), managers cannot exercise equity incentive tools unless the company meets its performance target in the evaluation year. If the company fails to meet the vesting requirements, the corresponding incentive tools (options or restricted stocks) will be written off. Therefore, managers holding vesting equity have strong incentives to inflate the ROE and meet the target.

Several advantages also reside in this research setting. First, the performance-vesting equity incentive plans in China's stock market are all designed in the pattern of 'one-time grant with staged exercise,' where the performance period evaluating ROE is one year. Therefore, we can identify the timing when managers manipulate ROE by dividends more accurately, compared with the potential refinancing setting that requires a three-year averaged ROE, thus improving empirical tests' power. Second, compared with the potential settings like the semi-mandatory dividends policy or dividend commitment, the ROE-vesting equity incentive plans do not explicitly require dividend payments, thus can be examined firms' ROE-induced dividends more exogenously.

We manually collect data on A-share listed firms' performance-vesting equity incentive plans from 2006 to 2016, focusing on those who select weighted average ROE as the performance target. We obtain the following findings. (1) Compared with other observations, firms with pre-dividend ROE slightly below the target are more likely to issue dividends or to issue more dividends. (2) Because the weighted average ROE's computation puts more weight on early payouts, firms with pre-dividend ROE slightly below the target are more likely to pay dividends in advance, indicating that such firms consider both the timing and the amount of dividend payouts. (3) We also rule out the possibility of pseudo correlation. There is no similar result from falsification tests based on earnings growth, echoing the logic that dividends do not contribute to earnings growth. Besides, we use just meeting ROE target as an alternative ex-post measure of ROE inflation incentive and find results consistent with our main findings. (4) We further analyse the relationship between dividends and traditional earnings management. We find that managers will implement lower accrual/real earnings management levels if they decide to increase ROE through dividends. (5) Ultimately, we examine the value consequences of these ROE-induced dividends. We find that dividends paid to achieve the ROE target are harmful to firm value in the long run, even though investors earn some dividends in the short term.

We make three main contributions. First, to our best knowledge, this is the first study demonstrating ROE-induced dividends in a large sample, which extends the literature on firms' dividend policies.[7] Previous literature mainly focuses on western classical dividend theory or Chinese regulatory policies to explain A-share listed corporations' dividend behaviours (Li et al., 2017; Wei et al., 2017; Zhi et al., 2014), while it pays rare attention to whether management seeks personal benefits through dividends. Our paper provides evidence on managers' distorted motivation to pay dividends based on ROE-vested

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[7]According to the search results on CNKI (https://www.cnki.net) with keywords such as 'dividend' and 'cash dividends,' as of 20 December 2020, there was no journal or paper speaking about ROE-induced dividends. So far, the most relevant literature, however, based on U.S. stock market, examines corporate undertaking share repurchase to improve EPS (Almeida et al., 2016; Cheng et al., 2015; Kim & Ng, 2018). Although these papers share a similar logic with ours, we have notable differences in earnings management tools (dividend vs. share repurchase), earnings management targets (ROE vs. EPS), research setting (performance-vesting equity incentive plans vs. short-term EPS market pressure), and institutional background (China, dividend culture vs. U.S., share repurchase culture).

equity incentive plans. Our results could help regulators evaluate regulations that use ROE as a bright-line threshold, especially those that simultaneously require the level of ROE and dividends, such as refinancing regulations. Regulators should consider the possibility that companies attempt to meet both dividend and ROE requirements by paying dividends. Besides, our paper also reminds investors to be cautious about the dividend when managers have personal benefits – that is, not all dividends are for rewarding investors.

Second, our paper also supplements the literature on equity-based compensation. Previous studies usually perceive the equity incentive plans as an effective tool to alleviate managers' myopia. Few studies examine whether short-term performance-vesting targets add frictions and thus exacerbate managers' short-term behaviour. According to Xie et al. (2019), performance-vesting conditions induce short-term behaviours such as classification shifting between recurring and non-recurring items. This paper points out a more severe long-term economic consequence from the perspective of dividend payouts. These findings have important implications for the board/compensation committee in designing vesting requirements and other provisions in equity incentive plans.

Last, our paper enriches the earnings management literature, especially the literature on the trade-offs between different earnings management methods. Previous studies mainly focus on firms' trade-offs between accrual and real earnings management (Cohen et al., 2008; Gong et al., 2015; Zang, 2012), neglecting the possibility that dividends may be a means of earnings management. In the context of ROE-vested equity incentive plans, we document the substitution effects between 'denominator methods', represented by dividends, and 'numerator methods', represented by traditional earnings management methods, thus extending the literature on the trade-offs between different earnings management methods.

The rest of the paper is as follows. Section 2 reviews the related literature. Section 3 provides the theoretical analysis and hypothesis development. Section 4 elaborates the research design. Empirical results are reported in Section 5. Robustness tests are presented in Section 6. We further conduct additional analysis in Section 7. Section 8 concludes the paper.

2. Literature review

2.1. Literature on dividends

When Modigliani-Miller assumptions are relaxed, the dividend determinants have always been a puzzle (Black, 1976). Various theories have been proposed to explain firms' dividend behaviours, including the clientele effect (Desai & Jin, 2011), free cash flow agency theory (Jensen, 1986; La Porta et al., 2000), signalling theory (Bhattacharya, 1979; Kumar, 1988; Miller & Rock, 1985), and catering theory (Baker & Wurgler, 2004a, 2004b). Chinese scholars also conduct numerous studies to examine these theories' explanatory power for A-share listed firms' dividend behaviours. For example, Li et al. (2017) find that individual investors' dividend tax burden significantly impacts corporate payouts. Zhi et al. (2014) find that firms' dividend payouts become more aligned with retail investors' preferences after the split-share reform. Zhang and Wang (2015) find that despite greater information asymmetry, there is no significant evidence that companies located in remote areas reduce agency costs through dividends. Wang and Wang (2014) find that dividend

commitment signals firm value, while Lv and Xu (2010) deny dividends' signalling effect for Chinese listed companies. It should be noted that these dividend theories implicitly assume that firms' dividend payouts are not contaminated by regulations. However, the CSRC has implemented various guidance to encourage firms to pay dividends, which weakens the explanatory power of classical dividend theories (Wei et al., 2017). Therefore, China's institutional environment should be paid attention to when analysing Chinese companies' incentives of issuing dividends.

Despite the limitations of regulations, CSRC's dividend-advocating regulations have significantly improved dividend payouts in the Chinese capital markets.[8] For example, Wei et al. (2014) document that the semi-mandatory dividend policy greatly improved companies' willingness to pay and payout levels. Wang et al. (2017) find that the CSRC's differentiated dividend guidance significantly promoted the sensitivity between dividend payout ratio/dividend yield and growth/main investment arrangements. Because of these persistent advocacies of dividends, the notion that companies reward investors by dividends is deeply rooted in investors' minds. On the other hand, there are doubts about whether A-share listed companies have sustained dividend payouts capability. Xie (2013) proposes the concept of 'Ponzi dividends' – that is, firms paying dividends are financed by shareholders' investment or creditors' loans, rather than by the accumulated free cash flow generated from operating activities. Xie and Lin (2013) further find that the dividends paid by the constituent stocks of the SSE 50 and the SSE Dividend Index were mostly Ponzi dividends. Based on these stylised facts, it is natural to ask why companies pay dividends even when they cannot do so? Do managers pursue personal benefits through paying out dividends under the disguise of rewarding investors? Investors, regulators, and other capital market participants should pay attention to these important issues. Unfortunately, the literature covering this topic is relatively limited, and there is no large-sample analysis investigating whether ROE is manipulated through dividends.

2.2. Literature on equity compensation

There is extensive literature on equity compensation. Here we reviewed only those papers directly relevant to our research topic, i.e. related to dividend behaviours. Studies based on U.S. capital markets generally suggest that stock options are negatively correlated with dividend payouts because stock options are not dividend-protected. Dividend protection refers to the corresponding ex-dividend and ex-right treatment of stock options' exercise price once the company issues dividends before managers' exercise. Stock option plans in the U.S. are generally non-dividend-protected, i.e. the exercise price is fixed. Therefore, the option value will decrease after dividend payments (as predicted by the Black–Scholes formula), which greatly reduces managers' willingness to pay dividends (Fenn & Liang, 2001; Lambert et al., 1989).

On the other hand, according to CSRC's regulations on equity incentive plans, both stock options and restricted stocks are dividend-protected, implying that these equity compensation tools are free from the impacts of the ex-dividend price drops in China.

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[8]Please refer to Li et al. (2010) and Wei et al. (2014) for the discussions on the limitations of dividend-advocating regulations.

However, existing Chinese studies report mixed conclusions regarding the relationship between equity incentive plans and corporate payouts. For example, Lv and Zhang (2012) conclude that companies with equity incentive plans are more reluctant to pay dividends, and the dividend payout ratio is lower than before. Xiao and Yu (2012) document that the dividend payout ratio is significantly higher for firms with equity incentive plans one year before implementing equity incentive plans. Besides, they also suggest that equity incentive plans have a significant positive effect on dividends. Xie and Tang (2014) find that companies adopting restricted stocks are more likely to pay dividends than companies that use stock options as the equity incentive tool. In response to these conflicting findings, Wan (2018) appeals for more rigorous research designs and more empirical evidence.

Despite the differences in research design, we posit that the main reason for these conflicting results is that the literature only makes a broad comparison between companies that implement equity incentives and those that do not, neglecting equity compensation's contractual arrangements, especially the vesting requirements. When companies fail to meet performance targets, managers cannot exercise the incentive tool. Therefore, the binary categorisation between firms with and without equity compensation would misclassify some observations essentially without the equity incentive effect to the category implementing equity incentive plans. Besides, previous literature usually treats all companies with an equity incentive plan identically and barely considers the possible influence of managers' motivation to meet the vesting requirements. Given the existing literature's limitations, this paper focuses on firms implementing equity incentive plans to examine the impact of ROE vesting requirements on corporate dividend behaviours.

3. Theoretical analysis and hypothesis development

In sharp contrast with firms' autonomy in the U.S., Chinese listed companies' equity incentive plans are subject to many regulations. According to the CSRC's regulations, all equity incentive plans must be performance-vested. In practice, the vesting requirements are usually characterised by 'zero deferral' and 'all-or-none' (Xie et al., 2019). Specifically, all equity incentive plans must have a performance-vesting requirement in each performance period. Companies must meet these vesting requirements; otherwise, managers cannot exercise the corresponding incentive tools. Suppose a company fails to meet the performance target. In that case, the corresponding incentive tools can neither be deferred to future years ('zero deferred') nor be exercised proportionally according to the performance achievements ('all-or-none'), but can only be written off/cancelled.

Many equity incentive plans in China use weighted average ROE and earnings growth as the performance measures. Previous studies show that the ROE-vesting target is more difficult to meet (Xie et al., 2019). According to Xie et al. (2019), only 62.36% of observations meet the ROE-vesting target, lower than the meeting rate of observations adopting earnings growth (66.11%). The possible reason is that firms can boost earnings growth by expanding their size. However, ROE is a scaled measure determined by the firm's profitability, operating efficiency, and capital structure. Therefore, meeting the ROE-vesting target would be more challenging for managers.

Given the difficulty of meeting the ROE-vesting target, accompanied by the pressure from 'zero deferred' and 'all-or-none,' managers are highly motivated to achieve ROE by any possible means. For manipulating ROE, managers can either manipulate earnings upwards ('the numerator method') or manipulate net assets downwards ('the denominator method'). Traditional earnings management tools, such as accrual and real earnings management, are all numerator methods. In a meeting ROE context, the retained part of the numerator manipulation will be counted in net assets and thus partially offset the effect of increasing ROE. Besides, traditional earnings management is relatively easy to detect. For example, accrual earnings management often relies on changes in accounting policies and estimates, which usually require the independent directors' approvements and public disclosure. Real earnings management also bears similar drawbacks. Operational decisions such as credit sales, operating expense reductions, or overproductions will receive extensive internal/external monitoring, e.g. compensation committees, auditors, and even regulators. Considering these potential drawbacks, we conjecture that managers tend to adopt the more invisible denominator methods, especially dividends, to meet the ROE target.[9] Specifically, on the one hand, dividends increase ROE because they directly reduce owners' equity. On the other hand, dividend payouts are widely referred to as rewarding shareholders and highly advocated by regulators, thus unlikely to be questioned by stakeholders. Therefore, managers would prefer to increase ROE by paying dividends, disguising their self-interested motivations as rewarding investors.

It should be pointed out that according to China's *Company Law* and the articles of association of listed companies, the board can only propose the dividends issuing plan, while the proposal will be passed at the shareholders' meeting. As the dividends issuing proposal is a combination of opinions from insiders (the chairman, CEO, directors representing the interests of other shareholders, and CFO) and from the controlling shareholder, in most cases, it will be approved at the shareholders' meeting. The question, then, is whether the controlling shareholders and the board support such ROE-induced dividends. There could be two scenarios that speak to their supports. First, the directors (including independent directors) and controlling shareholders are unaware of dividends' impact on ROE. However, they know that dividends align with the capital market's expectations and will be welcomed by regulators and investors. Therefore, board members and the controlling shareholder will support the dividend payout unless it harms the company's operation and financial security. The second scenario is that board members and the controlling shareholder are aware of dividends' effect on ROE. Suppose the pre-dividend ROE is close to the vesting requirements. In that case, the directors and controlling shareholder may be unwilling to fail the vesting target, which could demoralise employees (especially when the equity tool earns substantial paper profits) and result in departure of high-quality employees. In other words, even though paying out dividends to increase ROE might have some costs, it may not outweigh the costs of failing the vesting target. Besides, a company's dividend policy is generally determined in the first half of a year, when it is still uncertain whether the vesting target can be met. As a result,

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[9]Besides dividends, the denominator method can also achieve by share repurchase. However, due to restrictions on share repurchase by listed companies before the revision of China's Company Law in 2018, there are very few observations implementing share repurchases. In our sample period, only 3% of the A-share listed company observations have implemented a share repurchase (most of which result from the failure of restricted stock incentives).

board members and the controlling shareholder will support paying dividends to reduce managers' uncertainty and help them meet the performance target.

Based on the above analysis, we propose our research hypothesis:

For firms implementing equity incentive plans with ROE as the performance measure, those having some difficulties meeting ROE target, i.e. pre-dividend ROE slightly miss the target, are more likely to issue dividends and pay more dividends than others.

4. Research design

4.1. Sample selection and data sources

We manually collect 1,057 equity incentive plans of Shanghai and Shenzhen A-share listed companies from 2006 to 2016, of which 1,022 are kept for empirical analysis after excluding those with special vesting arrangements or performance measures.[10] The sample selection procedure and descriptions are presented in Table 1. We find that 458 (44.81%), 958 (93.74%), and 277 (27.10%) equity incentive plans use the weighted average ROE, net income growth, and operating income growth as performance measures, respectively. Table 1 reveals that ROE and net income growth are the most commonly adopted performance measures in equity incentive plans, which is consistent with the findings in Xie et al. (2019).

We use the 458 equity incentive plans (1,339 'firm-performance evaluation year' observations) with weighted average ROE as the performance measure to construct our research sample. To ensure our main results' robustness, we also exploit the equity incentive plans adopting other performance measures in additional analysis. In the regressions, observations with missing variables are excluded. The financial data are retrieved from the CSMAR database, and industries are classified based on the CSRC criteria (2012). All continuous variables are winsorised annually at 1% and 99% to reduce the impact of outliers.

Table 1. Sample selection and sample composition.

	Number of plans	Observations of 'firm-performance evaluation year'
Equity incentive plans from 2006 to 2016	1,057	2,619
Excluding:		
Plans with special vesting arrangements or performance measures	35	107
Plans nullified or terminated in advance	-	74
Final sample	1,022	2,438
Sample composition:		
Plans with the weighted average ROE as the performance measure	**458**	**1,339**
Plans with net income growth as the performance measure	958	2,316
Plans with revenue growth as the performance measure	277	672

There might be multiple performance measures in a single equity incentive plan, hence the sum of plans adopting different performance measures is not equal to the total number of equity incentive plans.

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[10]Plans with special vesting arrangements are like those not in an 'all-or-none' pattern, e.g. the equity incentive plan of Dr. Peng Telecom & Media Group (ticker: SH600804) in 2013. This plan set an upper and lower performance-bound for vesting requirements. When the company's performance falls in the interval, managers can vest a proportion of the stock options/restricted stock based on the percentage of performance achievements. For details, please refer to *Draft of Stock Option and Restricted Stock Incentive Plan of Dr. Peng Telecom & Media Group in 2013 (Revised Version).*

4.2. Incentives to meet the ROE target by dividends: variable definitions and preliminary evidence

Obviously, not every company that adopts ROE in its equity incentive plan has the incentive to inflate ROE by paying dividends. Managers are less likely to behave opportunistically when the firm has already shot or fallen too much from the target. Therefore, following Cheng et al. (2015) and Kim and Ng (2018), we measure managers' incentives to issue ROE-induced dividends by determining whether the pre-dividend ROE is slightly below the ROE target. We calculate the pre-dividend ROE as follows.

We first present the CSRC's formula for computing the weighted average ROE:

$$ROE = P_0 / \left(E_0 + NP \div 2 \ + E_i \times M_i \div M_0 - E_j \times M_j \div M_0 \pm E_k \right)$$

P_0 is the earnings adopted in calculating ROE, which could be net income excluding or including non-recurring items. E_0 is the beginning owner's equity attributable to the parent company. NP is the earnings attributable to the parent company in the current period. E_i is the increase in net assets during the reporting period due to issuance of new shares or the switch of convertible bonds. E_j is the decrease in net assets caused by repurchases or dividends during the reporting period. M_0 is the number of months in the reporting period, i.e. 12. M_i is the cumulative number of months from the month following the increase in net assets to the end of the reporting period. M_j is the cumulative number of months from the month following net asset reduction to the end of the reporting period. E_k is the time-weighted increase or decrease in net assets attributable to the parent company due to other transactions or events.

Based on the formula, we backdate the dividends' effects on the numerator and denominator of ROE then calculate the company's pre-dividend ROE (*As-if ROE*). The corresponding equation is as follows:

$$As - if \ ROE = \ (P + C) / \left(E + E_j \times M_j \div M_0 \right)$$

P is the net income excluding or including non-recurring items, which is defined according to the equity incentive plan's requirements.[11] The denominator E for calculating the weighted average ROE of companies is derived from P and the weighted average ROE reported by the company, and we add back the influence of dividends on the denominator, namely, $E_j \times M_j / M_0$ (the definitions of E_j, M_j, and M_0 are the same as above; we calculate each dividend separately and add it up in case multiple dividends occur during the reporting period). We also take into account the influence of dividends on the numerator, i.e. the opportunity income of dividend C (measured by dividend amount × average yield of Chinese on year treasury bonds × (1- effective tax rate), where the effective tax rate = income tax expense/total pre-tax earnings).[12]

By subtracting the ROE target from the company's pre-dividend ROE (*As-if ROE*), we can obtain the difference between the ROE target and the pre-dividend ROE. Similarly, we also obtained the difference between the ROE target and realised ROE by subtracting the ROE

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[11]According to the *Memorandum No. 2 on Equity Incentive Matters* released by the CSRC, most plans use the net income excluding non-recurring items as the performance-vesting measure, while the rest uses the lower one of the net income including and excluding non-recurring items.

[12]Government bond yields are exempt from corporate income tax in China. However, here we just use the treasury bond yields to measure the opportunity return rate of dividends. The empirical results of our paper are robust to the specification without considering corporate income tax.

target from the actual realised ROE in the performance evaluation year. We present the distribution of the two differences in Figure 1. The right half of Figure 1 reports the distribution of the difference between the actual ROE and the ROE target. Nearly 15% of the observations fall in the first interval right of point 0, much higher than the bars in other intervals. However, only a few observations fall in the first interval left of point 0. In other words, the right part of Figure 1 depicts a jump at point 0, suggesting that some companies that otherwise fail to meet the vesting requirements meet the target by manipulating ROE measures. The distribution of the difference between the pre-dividend ROE and the ROE target is reported in the left half of Figure 1. We can see that the percentage of observations whose pre-dividend ROE is slightly below the ROE target is significantly larger than its counterpart on the right side of Figure 1. The jump pattern is also weaker in the left distribution figure. Comparing the left and the right halves of Figure 1 provides preliminary support for the research hypothesis, implying that managers use dividends to attain the ROE requirement.[13]

Therefore, we follow Kim and Ng (2018) and define a dummy variable *ASMISS*, which equals 1 if the pre-dividend ROE is less than the ROE target within −1%~0 (i.e. the first interval left of 0 in the left part of Figure 1), and 0 otherwise.[14]

4.3. Regression model and other variables

We measure firms' dividend behaviours with a dummy variable *DIV*, which equals 1 if the firm pays dividends, and a continuous variable dividend payout ratio (*PAYOUT*). We test the hypothesis with Model (1). When the dependent variable is *DIV*, following Edmans et al. (2018), we use the linear probability model to estimate the parameters.[15] When the dependent variable is *PAYOUT*, we adopt a Tobit model for estimation. We expect companies with pre-dividend ROE slightly below the ROE target (*ASMISS*) to pay (more) dividends, i.e. a_1 is significantly positive.

$$DIV_t(\text{ or } PAYOUT_t) = a_0 + a_1 ASMISS_t + CONTROLS + e_t \tag{1}$$

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[13]Although the pre-dividend jump at point 0 in the left part is less evident than the post-dividend jump in the right part, the discontinuity at point 0 is still there even after adjusting dividends. There are three possible reasons for this pattern. (1) Dividends are usually carried out early in a year, and many other post-dividend factors could contribute to firm performance; thus, dividends are not the only determinant of the distribution. (2) Companies could adopt traditional earnings management tools to meet the ROE target. (3) Besides ROE, some equity incentive plans evaluate other performance measures. In empirical tests, we control for accrual earnings management (*DA*) and real earnings management (*REM*) to examine the incremental impact of dividends on ROE to address these potential disturbances. In further analysis, we discuss the substitution effect between dividend and traditional earnings management (Table 10). In robustness tests, we further add a dummy variable, 'whether the equity incentive plan set other performance-vesting conditions,' to the regression model and derive consistent results.

[14]It should be noted that some companies may not know the exact value of pre-dividend ROE in advance because dividends are usually carried out early in a year. Therefore, there may be measurement errors in *ASMISS*. In other words, it may wrongly capture some observations without the incentive to meet ROE targets (e.g. the pre-dividend ROE falls into the range of *ASMISS* for other reasons). However, as long as the measurement errors are independent, they will not lead to biased findings, let alone the measurement error of the explanatory variable is a bias against finding results. To further mitigate the concern, in subsequent empirical tests, we re-estimate our main results through a dummy variable *MEET* (the post-dividend ROE is slightly larger than the ROE target), which is an ex-post measure of earnings management incentive, and we report consistent results in Table 8. The main empirical results are also robust after the threshold value of *ASMISS* (1%) is varied by ±20%.

[15]The regression model controls both year and industry fixed effects, while 27 observations belong to the same industry and have no *DIV* variations. If we use the traditional Probit or Logistic models, these observations will be automatically removed due to the perfect prediction problem. However, all of the empirical results remain robust in both the Probit and Logistic models. The results are untabulated but are available for readers upon request.
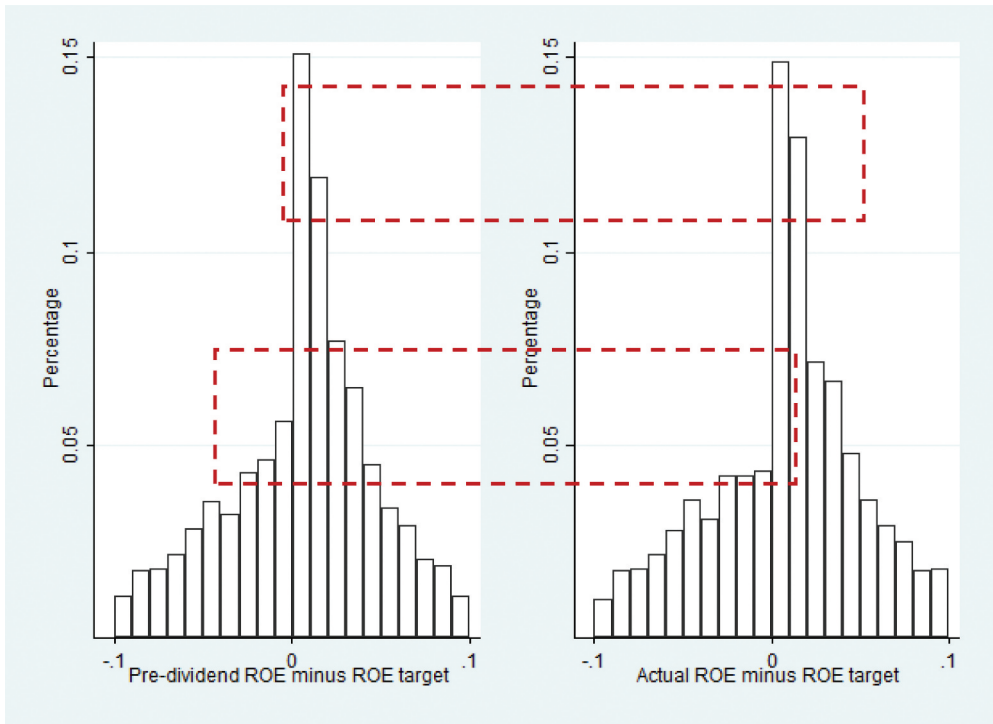
Figure 1. Distribution of the difference between pre-dividend/realised ROE and the ROE target. The left half of Figure 1 depicts the distribution of the difference between the pre-dividend ROE and the ROE target; the right half of this figure depicts the distribution of the difference between the actual realised ROE and the ROE target. The horizontal axis is the difference between the pre-dividend /realised ROE and the target ROE, and the vertical axis is the proportion of observations falling into the corresponding interval. The column width is 0.01. Observations outside [−0.1, 0.1] are suppressed to avoid outliers; the observations covered by the histograms account for 87.75% of the sample size.

The weighted average ROE calculation puts more weight on dividends issued earlier, as one month early is equivalent to an 8.33% (1/12) increase in the payout amount in one month lag. Therefore, the earlier the dividend payment, the greater the increase on the weighted average ROE. We thus use Model (2) to examine whether managers who are motivated to boost ROE issue dividends earlier.[16] Considering that firms usually issue dividends cyclically (Bessembinder & Zhang, 2015), we measure dividend payouts' timeliness (*DIFMONTH*) by subtracting the current dividend issuing month by the dividend issuing month in the previous year. If there is no dividend in the previous year, we use the median month of other companies within the same industry to fill in the value. We estimate Model (2) by the OLS procedure and multiply *DIFMONTH* by '-1' to make the regression coefficients easy to interpret. We also estimate a Tobit model with a weighted

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[16]Managers can affect the timing of dividends. In China, the common practice of dividend payout is that the board first proposes the company's dividends issuing plan, followed by the approval at the shareholders' meeting, and then the final implementation. Managers can affect the dividends' timing by holding the board meeting and the shareholders' meeting as early as possible, and carrying out dividends soon after the shareholders' meeting. As the weights in the weighted average ROE are counted monthly, the ROE could increase significantly even by just moving the original payout date forward by one day (i.e. from April 1 to March 31).

payout ratio (*WPAYOUT*) as the dependent variable. *WPAYOUT* is calculated by multiplying the dividend amount and '1- dividend issuing month/12,' thereby integrating both the amount and the timeliness of dividends. We expect β_1 to be significantly positive if a company with pre-dividend ROE slightly below the ROE target inflate ROE by paying dividends early.

$$DIFMONTH_t(\text{or } WPAYOUT_t) = \beta_0 + \beta_1 ASMISS_t + CONTROLS + e_t \tag{2}$$

We also control the traditional earnings management methods that managers potentially adopt and explore the incremental impact of dividends on ROE, i.e. accrual earnings management (*DA*) and real earnings management (*REM*). Following the literature, we further control for the type of incentive tools (*STOCK*), state-owned enterprise (*SOE*), size (*SIZE*), leverage (*LEV*), market-to-book ratio (*MTB*), return on total assets (*ROA*), operating cash flows (*CFO*), chairman severing as CEO (*DUAL*), shareholding percentage of the largest shareholder (*FSHR*), and year (*YEAR*) and industry (*IND*) fixed effects.[17] Table 2 reports the definitions of the main variables.

5. Empirical results

5.1. Sample composition

Table 3 reports the meeting rate for different vesting years and different tools. Plans using earnings growth are also listed for comparisons. As shown in the table, the average meeting rate of ROE targets is 62.36%, suggesting that more than a third of the observations fail to meet the ROE target. The difficulty of meeting the ROE requirement increases monotonically as the vesting period moves forward, and therefore the meeting rate decreases accordingly. Only 38.04% of the companies meet the ROE target in the fourth performance evaluation year. The overall earnings growth targets' meeting rate is 66.11%, which is higher than that of the ROE measure. Besides, regardless of the vesting years and no matter which incentive tool is adopted, the meeting rate of earnings growth targets is higher than that of the ROE measure. The findings in Table 3 support our argument in the previous section that ROE is relatively harder to meet than earnings growth is.

5.2. Descriptive statistics

Table 4 reports descriptive statistics for the main variables. The mean of *DIV* is 0.907, indicating that most of the sample observations are associated with dividend payouts, accompanied by the average payout ratio (*PAYOUT*) as of 32.9%. In untabulated results, the sample median amount of dividends is 36.8 million yuan, accounting for 2.70% of the net assets (the sample mean amount of dividends is 134 million yuan, accounting for 3.55% of the net assets), which suggests the non-negligible dividends' effects on increasing ROE. In terms of dividend timeliness (*DIFMONTH*), the median value is 0, and the mean is also close to 0, implying that firms issue dividends cyclically. However, the standard

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[17]The control variables are constructed using financial information contemporary to the dependent variable. Because in our research setting, managers' incentives in making a dividend payout in year *t* is to attain the ROE requirement in that year. Hence controlling contemporary information is more accurate. Nevertheless, our findings remain consistent if the control variables are all lagged for one year.

Table 2. Variable definitions.

Variables	Definitions
DIV	A dummy variable equal to 1 if the company pays dividends in year t and otherwise 0.
PAYOUT	Company's dividend payment amount in year *t* deflated by the earnings attributable to the parent company in year *t-1*.
DIFMONTH	(The company's dividend payment month in year *t* minus dividend payment month in year *t-1*) times −1. If the company does not pay dividends in year *t-1*, then we use the median value of the dividend payment month of the companies in the same industry; If the company pays dividends more than once within a year, we use the earlier/earliest dividend month.
WPAYOUT	The company's dividend payment amount in year *t* times '(1- payout month/12),' and then deflated by the earnings attributable to the parent company in year *t-1*. If the company pays dividends more than once in a year, each dividend is calculated separately and then accumulated.
ASMISS	A dummy variable equal to 1 if the company's pre-dividend ROE is lower than the ROE target within (−1%, 0) and otherwise 0.
DA	Residuals estimated from year-industry cross-sectional regressions based on Dechow et al. (1995) modified Jones model.
REM	The sum of negative abnormal operating cash flows, negative abnormal expenditures and abnormal production costs. Abnormal operating cash flows, the abnormal expenditures, and the abnormal production costs are estimated from year-industry cross-sectional regressions based on Roychowdhury (2006).
STOCK	A dummy variable equal to 1 if restricted stock is adopted as the tool in the performance-vesting equity incentive plan and otherwise 0.
SOE	A dummy variable that is equal to 1 if the company is a state-owned enterprise in year t and otherwise 0.
SIZE	Natural log value of total assets in year *t*.
LEV	Total liabilities deflated by total assets in year *t*.
MTB	Total equity capitalisation in year *t* deflated by net assets in year *t*.
ROA	Earnings in year *t* deflated by the average total assets in year *t*.
CFO	Operating cash flows in year *t* deflated by the average total assets in year *t*.
DUAL	A dummy variable equal to 1 if the board chairman and the CEO of the company is the same person in year *t* and otherwise 0.
FSHR	The shareholding percentage of the largest shareholder in year *t*.

Table 3. The meeting rate of performance-vesting requirements in equity incentive plans.

Performance Measures	Total	Vesting Year				Incentive Tool		
		1	2	3	≥4	Restricted stock	Stock option	Share appreciation right
ROE	1,339/**835**	458/**350**	423/**270**	366/**180**	92/**35**	547/**376**	777/**450**	15/**9**
Meeting rate (%)	62.36	76.42	63.83	49.18	38.04	68.74	57.92	60.00
Earnings growth	2,316/**1,531**	958/**734**	737/**483**	508/**267**	113/**47**	1,212/**880**	1,079/**635**	25/**16**
Meeting rate (%)	66.11	76.62	65.54	52.56	41.59	72.61	58.85	64.00

(1) Numbers in bold represent the number of observations that meet the targets; (2) Because an equity incentive plan may adopt multiple performance measures, such a plan will only be counted in bold numbers only if all the performance targets are met.

deviation of *DIFMONTH* is 1.244, indicating that there are still large variations across companies. The mean of the weighted payout ratio (*WPAYOUT*) is 18%, which is lower than the raw payout ratio (*PAYOUT*), echoing the reasons why we should consider both the amount and the timing of dividend payouts. About 5.5% of the sample observations have a pre-dividend ROE slightly below the ROE target (*ASMISS*), and 40.9% of the companies adopt restricted stock as the equity incentive tool (*STOCK*). The mean value of *SOE* is only 9.9%, which is consistent with the literature. Therefore, the descriptive statistics reported in Table 4 are close to the characteristics of non-*SOE* firms.

Table 4. Descriptive statistics.

Variable	Observations	Mean	Standard Deviation	Min	P25	Median	P75	Max
DIV	1339	0.907	0.290	0	1	1	1	1
PAYOUT	1338	0.329	0.340	0.000	0.151	0.270	0.421	4.626
DIFMONTH	1215	−0.025	1.244	−4.5	−1	0	1	5
WPAYOUT	1338	0.180	0.194	0.000	0.079	0.142	0.231	2.628
ASMISS	1339	0.055	0.229	0	0	0	0	1
DA	1321	0.021	0.081	−0.263	−0.029	0.018	0.063	0.408
REM	1264	−0.106	0.278	−1.421	−0.231	−0.054	0.063	1.012
STOCK	1339	0.409	0.492	0	0	0	1	1
SOE	1339	0.099	0.299	0	0	0	0	1
SIZE	1339	21.983	1.123	19.950	21.183	21.764	22.560	26.872
LEV	1339	0.376	0.200	0.030	0.200	0.368	0.520	0.869
MTB	1339	4.516	2.823	0.627	2.608	3.820	5.549	20.247
ROA	1338	0.075	0.052	−0.057	0.041	0.068	0.098	0.348
CFO	1338	0.060	0.085	−0.222	0.007	0.057	0.108	0.395
DUAL	1322	0.351	0.477	0	0	0	1	1
FSHR	1339	0.335	0.138	0.037	0.226	0.321	0.425	0.806

5.3. Regression analysis

5.3.1. The incentive to meet ROE targets and dividend payouts

Table 5 reports the results of the baseline regression. In Columns (1) and (2), the dependent variable is dividends dummy (DIV), while in Columns (3) and (4), the dependent variable is payout ratio (PAYOUT). As shown in Table 5, ASMISS is significantly positively associated with DIV at the 1% significance level and positively correlated with PAYOUT at the 5% significance level. Moreover, the regression coefficients' economic and statistical significance is generally unchanged after controlling for traditional earnings management measures, such as accrual earnings management (DA) and real earnings management (REM). Overall, companies with strong incentives to meet the ROE vesting conditions are more likely to pay (more) dividends. In terms of economic significance, when a company's pre-dividend ROE is slightly below the ROE target, the probability of paying out dividends and the payout ratio are estimated to be 8.6% and 8.1% (approximately 24.6% of the sample mean) higher, respectively, than those of other companies.

5.3.2. The incentive to meet ROE targets and dividend timing

As mentioned before, the weighted average ROE calculation puts more weight on dividends issued earlier. Therefore, the earlier the dividend payment, the greater the increase on the weighted average ROE. Whether managers with strong incentives to meet the ROE target accelerate the dividend timing is tested in Table 6. According to the regression results in Columns (1) and (2), ASMISS is significantly positively correlated with the timeliness of dividends (DIFMONTH), indicating that companies with strong incentives to achieve the ROE target are more likely to issue dividends in advance. Columns (3) and (4) report the results of the weighted dividend payout ratio (WPAYOUT). The coefficient of ASMISS is significantly positive at 5%, regardless of whether traditional earnings management measures are controlled.[18] The findings in Column (3) and (4) suggest that companies consider both the scale and the timing of cash dividends to meet the ROE target.

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[18]As shown in Table. 6, Pseudo R^2 in Columns (3) and (4) are negative. According to the construction of Pseudo R^2, Pseudo $R^2 = 1-L1/L0$, where L0 is the value of log likelihoods of the constant-only model, and L1 is the value of log-likelihoods of the full model. The Pseudo R^2 in Columns (3) and (4) is negative, suggesting that 'L1> L0 > 0'.

Table 5. The incentive to meet ROE targets and dividends.

	DIV_t		$PAYOUT_t$	
	(1)	(2)	(3)	(4)
$ASMISS_t$	**0.088***	**0.086***	**0.083**	**0.081**
	(4.58)	**(4.44)**	**(2.39)**	**(2.28)**
DA_t		−0.110		0.114
		(−0.43)		(0.26)
REM_t		0.001		−0.073
		(0.02)		(−1.33)
$STOCK_t$	0.000	0.005	0.007	0.006
	(0.01)	(0.28)	(0.32)	(0.27)
SOE_t	−0.024	−0.027	−0.030	−0.025
	(−0.78)	(−0.87)	(−1.07)	(−0.83)
$SIZE_t$	0.039***	0.033***	0.023	0.017
	(3.26)	(2.69)	(1.37)	(0.99)
LEV_t	−0.205***	−0.138*	−0.389***	−0.351***
	(−2.88)	(−1.93)	(−3.18)	(−2.71)
MTB_t	−0.005	−0.008*	−0.005	−0.006
	(−1.11)	(−1.73)	(−1.08)	(−1.27)
ROA_t	0.610**	1.087***	−0.891**	−0.958
	(2.26)	(2.99)	(−2.56)	(−1.57)
CFO_t	−0.119	−0.283	0.434***	0.384
	(−0.85)	(−0.91)	(2.78)	(0.72)
$DUAL_t$	0.008	0.001	0.006	0.003
	(0.45)	(0.05)	(0.25)	(0.11)
$FSHR_t$	−0.021	0.025	0.214***	0.236***
	(−0.36)	(0.44)	(2.67)	(2.80)
YEAR	YES	YES	YES	YES
IND	YES	YES	YES	YES
Adjusted/Pseudo R^2	0.0369	0.0411	0.0926	0.0873
N	1321	1247	1321	1247

The values in brackets are *t*-statistics after the White Heteroscedasticity adjustment. *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.

5.3.3. Falsification tests on earnings growth

To exclude the possibility of pseudo-correlations and obtain further evidence for our main results, we conduct falsification tests based on equity incentive plans that use earnings growth as performance measures. Because cash dividends are unhelpful to earnings growth, companies having difficulties meeting their earnings growth target should not correlate with dividend behaviours.

In a similar vein to the design of *ASMISS*, we backdate the earnings with the opportunity income of dividend (defined identically to the construction of *ASMISS*) to compute the pre-dividend earnings. Next, we calculate the earnings attainment rate as the difference between pre-dividend earnings and earnings target deflated by the earnings target. We then define a dummy variable *ASMISSNI*, equal to 1 if the earnings attainment rate is within −5%~0% and otherwise 0. We replace *ASMISS* with *ASMISSNI* in Models (1) and (2) and report the regression outcome in Table 7. Table 7 reveals that companies with pre-dividend earnings slightly below the earnings target (*ASMISSNI*) are not positively associated with either the scale or the timing of dividends. Interestingly, the coefficients of *ASMISSNI* in all of the regressions are negative, and the coefficient is significantly negative at the 10% level when the explained variable is weighted payout ratio (*WPAYOUT*). This might result from the concerns of dividend re-investing income (opportunity income).

Table 6. The incentive to meet ROE targets and dividend timing.

| | $DIFMONTH_t$ | | $WPAYOUT_t$ | |
	(1)	(2)	(3)	(4)
$ASMISS_t$	**0.336****	**0.316***	**0.047****	**0.045****
	(2.02)	**(1.86)**	**(2.34)**	**(2.16)**
DA_t		0.680		0.146
		(0.65)		(0.57)
REM_t		0.108		−0.048
		(0.52)		(−1.50)
$STOCK_t$	0.024	0.047	0.003	0.003
	(0.30)	(0.59)	(0.28)	(0.20)
SOE_t	0.092	0.095	−0.028*	−0.024
	(0.64)	(0.64)	(−1.76)	(−1.39)
$SIZE_t$	−0.015	−0.015	0.013	0.010
	(−0.30)	(−0.28)	(1.41)	(1.00)
LEV_t	0.160	0.245	−0.229***	−0.205***
	(0.49)	(0.75)	(−3.25)	(−2.75)
MTB_t	0.051***	0.052***	−0.002	−0.002
	(2.83)	(2.95)	(−0.54)	(−0.73)
ROA_t	0.330	−0.442	−0.446**	−0.568
	(0.32)	(−0.29)	(−2.27)	(−1.64)
CFO_t	−0.086	0.893	0.225**	0.259
	(−0.15)	(0.70)	(2.55)	(0.85)
$DUAL_t$	0.050	0.032	0.003	0.001
	(0.66)	(0.41)	(0.22)	(0.07)
$FSHR_t$	−0.301	−0.372	0.106**	0.119**
	(−1.04)	(−1.24)	(2.31)	(2.48)
YEAR	YES	YES	YES	YES
IND	YES	YES	YES	YES
Adjusted/Pseudo R^2	0.0143	0.0079	−1.1927	−2.7274
N	1200	1131	1321	1247

The values in brackets are *t*-statistics after the White heteroscedasticity adjustment. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

Table 7. Falsification tests based on earnings growth.

| | DIV_t | $PAYOUT_t$ | $DIFMONTH_t$ | $WPAYOUT_t$ |
	(1)	(2)	(3)	(4)
$ASMISSNI_t$	**−0.098**	**−0.082**	**−0.038**	**−0.060***
	(−1.29)	**(−1.24)**	**(−0.12)**	**(−1.73)**
DA_t	0.493**	0.467	1.216	0.296*
	(2.17)	(1.52)	(1.51)	(1.74)
REM_t	−0.075*	−0.104**	0.068	−0.059**
	(−1.83)	(−2.13)	(0.43)	(−2.18)
$CONTROLS_t$	YES	YES	YES	YES
YEAR	YES	YES	YES	YES
IND	YES	YES	YES	YES
Adjusted/Pseudo R^2	0.0791	0.0825	0.0041	−7.4474
N	2108	2108	1838	2108

The values in brackets are *t*-statistics after the White heteroscedasticity adjustment. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively. Due to space constraints, the regression coefficients and the corresponding t statistics are not reported.

5.3.4. Ex-post measures of the incentive to meet ROE targets

The literature usually measures managers' motivation for earnings management based on ex-post indicators. For example, researchers often use 'small-profit companies' to measure earnings management motives (Burgstahler & Dichev, 1997). The ex-post approach is popular because in most research settings, the extent that earnings management contributes to the

Table 8. Ex-post measures of earnings management motives and ROE-induced dividends.

	DIV_t	$PAYOUT_t$	$DIFMONTH_t$	$WPAYOUT_t$
	(1)	(2)	(3)	(4)
$MEET_t$	0.067***	0.058*	0.205*	0.042**
	(3.53)	(1.81)	(1.86)	(2.22)
DA_t	−0.083	0.140	0.775	0.162
	(−0.33)	(0.31)	(0.75)	(0.64)
REM_t	−0.009	−0.081	0.078	−0.054*
	(−0.19)	(−1.49)	(0.37)	(−1.70)
$CONTROLS_t$	YES	YES	YES	YES
YEAR	YES	YES	YES	YES
IND	YES	YES	YES	YES
Adjusted/Pseudo R^2	0.0422	0.0874	0.0072	−2.7910
N	1247	1247	1131	1247

The values in brackets are *t*-statistics after the White heteroscedasticity adjustment. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively. Due to space constraints, the regression coefficients and the corresponding *t*-statistics are not reported.

reported earnings is unobservable, and researchers, therefore, have to use ex-post earnings management measures to proxy managers' ex-ante incentive. However, ex-post earnings management measures have noises. For example, Beaver et al. (2007) posit that the clustering of low-profit companies near point 0 is not necessarily a representation of earnings management, but could be due to the fact that the income tax law asymmetrically treats loss/profitable companies. In the main empirical tests reported in prior sections, *ASMISS* avoids this problem because it is constructed based on pre-dividend ROE. To verify the main results' robustness, we use an ex-post measure of earnings management incentive and repeat the main empirical analysis in this section.

Following Xie et al. (2019), we define a dummy variable *MEET* to measure whether a firm slightly beats the performance target. Specifically, we compare the realised ROE and the ROE target and set *MEET* equal to 1 if the difference between the two ROEs lies in the interval 0 ~ 1%. We then replace *ASMISS* by *MEET* in Models (1) and (2) and present the regression results in Table 8. As is shown, companies that slightly beat the ROE target are significantly positively correlated with dividend intensity and dividend timeliness, suggesting that such companies achieve the ROE target by issuing dividends.

To sum up, the results from Table 5 to Table 8 provide consistent evidence of ROE-induced dividends.

6. Robustness test

6.1. Addressing self-selection problems

Although nearly half of the equity incentive plans in our research sample use ROE as performance measures, which is highly representative, we use Heckman's two-stage model to mitigate potential sample selection bias further. To do this, in the first stage, we estimate the probability of adopting ROE as a performance measure using all of the control variables in the second stage regression plus the industrial average adoption rate of ROE as an exogenous regressor. In the second stage, we put the inverse Mills ratio obtained from the first stage estimation into the second stage regression as an additional control. The main findings are robust after controlling for the inverse Mills ratio, suggesting that our results are unaffected by

sample self-selection bias.[19] The corresponding results are untabulated but are available upon readers' request.

6.2. Alternative measures of dividend policy

In the previous sections, the dividend amount is deflated by the earnings attributable to the parent company in year *t-1* to calculate the payout ratio (*PAYOUT*) and the weighted payout ratio (*WPAYOUT*).This subsection uses alternative deflators such as the total assets, market capitalisation, or net assets attributable to the parent company in year *t-1* to re-measure companies' dividend scale and weighted dividend scale. The findings are robust under different dividend measurements. The corresponding results are untabulated but are available upon readers' request.

6.3. Independent variable defined by different thresholds

To further ensure companies' incentive to meet the ROE target by paying dividends, this subsection fluctuates the threshold of 1% for a variable 'slightly below the ROE target' (*ASMISS*), as defined above, by 20%. That is, if the difference between pre-dividend ROE (*As-if ROE*) and the ROE target is between −1.2% and 0%, *ASMISS* is 1, and otherwise 0. Or, if the difference is between −0.8% and 0%, *ASMISS* is 1, and otherwise 0. We re-perform the main tests based on the two newly defined *ASMISS* variables, and obtain consistent findings. The corresponding results are untabulated but are available upon readers' request.

6.4. Adding other control variables

To deal with the issue of omitted variables, we also perform the following tests. (1) We add more control variables, including non-recurring items (non-recurring items/total assets), corporate governance index constructed by principal component analysis (Zhou et al., 2020), a dummy variable indicating whether the firm is audited by a top ten accounting firm (Xie et al., 2019), and a dummy variable indicating whether the equity incentive plan sets other performance-vesting conditions. (2) We add the one year lagged value of the dependent variable as a further control when the dependent variable is the payout ratio (*PAYOUT*) or the weighted payout ratio (*WPAYOUT*).

7. Further analysis

7.1. The relationship between dividends and traditional earnings management

As we argue in the hypothesis development, dividends are more likely to be exploited than traditional earnings management tools in the ROE evaluation scenario. Besides, all of our empirical results estimate dividends' incremental effect after controlling for accrual and real earnings management. This part further explores the differences between

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[19]We also consider the sample selection bias of whether a company implements equity incentive plans or not, and the findings after controlling for this problem are generally consistent with the main results. The corresponding results are untabulated but are available upon readers' request.

dividends and traditional earnings management and discusses managers' trade-off between dividends and traditional earnings management.

Apart from the differences discussed in the previous sections, dividends are notably different from traditional earnings management in their timing flexibility. According to the weighted average ROE computation formula, the earlier dividends are issued, the greater their impacts on increasing ROE. While dividends should be issued as early as possible, traditional earnings management is more flexible in timing. For example, accrual earnings management that depends on changing accounting policies and accounting estimates could be conducted any time in the year. Real earnings management through aggressive credit policies, over-production, or cost reduction occurs during daily operating activities, rather than being restricted to a specific period. The literature also confirms that traditional earnings management is concentrated in the fourth quarter (Zhang, 2008).

In sum, managers with incentives to meet ROE targets should issue dividends early, then further employ traditional earnings management if needed. Therefore, we conjecture that once managers decide to inflate ROE through dividends, the probability and magnitude of using traditional earnings management will be significantly lower. To test this hypothesis, we replace the dependent variable in Model (1) by accrual earnings management measures (*DA*) and real earnings management measures (*REM*), respectively, and add the dummy variable *DIV* and its intersection with *ASMISS (ASMISS×DIV)* to the regression. As shown in Table 9, the coefficient of *ASMISS×DIV* is significantly negative at 1%, either with *DA* or *REM* as the dependent variable. This finding suggests that because managers are much relieved from meeting ROE pressure after paying dividends, the demand for traditional earnings management is reduced. Interestingly, the coefficients of *ASMISS* are all significantly positive at the 1% level in both columns of Table 9. This finding indicates that if managers with strong incentives to meet the ROE target do not carry out dividend payments, they will instead use traditional earnings management tools.

The empirical results in Table 9 reveal the substitution effect between the 'denominator methods' represented by dividends and the 'denominator methods' represented by traditional earnings management. The findings in Table 9 also provide additional supports for ROE-induced dividends.

7.2. The dark side of ROE-induced dividends: impacts on firm value

The previous sections provide substantial evidence of the dividends induced-by meeting the ROE target. In this part, we examine the cost of this type of dividend policy in terms of firm value.

In a perfect capital market, firm value is independent of its dividend policy and determined only by investment opportunities (Miller & Modigliani, 1961). However, due to market frictions and financial constraints, companies cannot finance all of their positive net present value projects using external funding. As Xie and Lin (2013) pointed out, few listed companies in China accumulate positive free cash flows from operating activities, indicating that ROE-induced dividends are very likely to crowd out valuable investment opportunities, thus impede firm value.

$$BHAR_{t+1} = \gamma_0 + \gamma_1 PAYOUT_t + \gamma_2 ASMISS_t + \gamma_3 PAYOUT_t \times ASMISS_t + CONTROLS + e_t \quad (3)$$

Table 9. Dividends and traditional earnings management.

	DA_t	REM_t
	(1)	(2)
$ASMISS_t$	0.028***	0.160***
	(5.09)	(6.65)
$ASMISS \times DIV_t$	−0.026***	−0.167***
	(−3.92)	(−5.19)
DIV_t	−0.001	0.001
	(−0.32)	(0.05)
$STOCK_t$	0.005**	−0.028**
	(2.11)	(−2.42)
SOE_t	−0.006	0.063***
	(−1.48)	(3.29)
$SIZE_t$	−0.001	−0.021***
	(−0.94)	(−2.82)
LEV_t	−0.007	0.113***
	(−0.69)	(2.68)
MTB_t	−0.001	−0.004
	(−1.64)	(−1.41)
ROA_t	0.998***	−1.519***
	(19.21)	(−9.11)
CFO_t	−1.013***	−1.846***
	(−46.13)	(−20.66)
$DUAL_t$	−0.006***	−0.006
	(−2.83)	(−0.55)
$FSHR_t$	0.007	0.134***
	(0.79)	(3.27)
YEAR	YES	YES
IND	YES	YES
Adjusted R^2	0.7858	0.5809
N	1304	1247

The values in brackets are *t*-statistics after the White heteroscedasticity adjustment. *, **, and *** indicate statistical significance at 10%, 5%, and 1%, respectively.

We construct Model (3) to estimate the effect of ROE-induced dividends on firm value.[20] We use the one year ahead buy and hold abnormal returns (*BHAR*) as the dependent variable; we are interested in the coefficient γ_3 on *Payout×ASMISS*. If the ROE-induced dividend leads to a decline in corporate value, the interacting item's coefficient should be significantly negative. As shown in Table 10 Column (1), the payout ratio (*PAYOUT*) is significantly positively correlated with *BHAR*. However, this positive correlation is significantly weakened when managers have strong incentives to meet the ROE target, as the coefficient of *PAYOUT×ASMISS* is significantly negative at 5%. The findings in Column (1) support our argument that ROE-induced dividends harm the firm value.

Another question worth exploring is whether investors are smart enough to see through the trick of ROE-induced dividends. If so, how will investors respond to such dividend issuing announcements? We use three-day [−1, +1] cumulative abnormal returns (*CAR*) to measure market reactions and use *CAR* as the dependent variable in

[20]We also follow Core et al. (1999) and apply another research design. We define a variable *Induced_PAYOUT*, which is the predicted value of payout ratio (*PAYOUT*) that could be explained by managers' incentive to meet ROE targets (*ASMISS*), and examine the association between *Induced_PAYOUT* and firm value. We derive similar results under this alternative specification. The corresponding results are untabulated but are available upon readers' request.

Table 10. The long-term and short-term returns to ROE-induced dividends.

	$BHAR_{t+1}$	CAR_t	$BHAR_{t+1}$	CAR_t
	(1)	(2)	(3)	(4)
$PAYOUT_t$	0.136**	0.006	0.107*	0.011
	(2.41)	(1.09)	(1.90)	(1.50)
$ASMISS_t$	−0.007	−0.013	0.009	−0.010
	(−0.07)	(−1.00)	(0.07)	(−0.71)
$PAYOUT_t \times ASMISS_t$	**−0.338****	**0.034**	**−0.293***	**0.036**
	(−2.08)	**(1.04)**	**(−1.71)**	**(1.00)**
$DA_{t/t-1}$	−1.416***	0.073***	−1.197***	0.092***
	(−3.24)	(2.86)	(−2.66)	(3.23)
$REM_{t/t-1}$	0.041	−0.023***	0.002	−0.026***
	(0.52)	(−2.92)	(0.02)	(−3.00)
$STOCK_{t/t-1}$	0.059*	−0.004	0.089**	−0.002
	(1.69)	(−1.01)	(2.37)	(−0.41)
$SOE_{t/t-1}$	−0.029	−0.003	−0.056	−0.003
	(−0.48)	(−0.57)	(−1.18)	(−0.48)
$SIZE_{t/t-1}$	−0.069***	−0.001	−0.065***	0.001
	(−2.75)	(−0.48)	(−2.69)	(0.52)
$LEV_{t/t-1}$	0.417***	0.018	0.642***	−0.002
	(2.82)	(1.27)	(4.35)	(−0.11)
$MTB_{t/t-1}$	−0.046***	0.000	−0.037***	0.001
	(−5.41)	(0.19)	(−4.91)	(0.67)
$ROA_{t/t-1}$	1.220*	0.025	1.346*	−0.019
	(1.85)	(0.51)	(1.90)	(−0.35)
$CFO_{t/t-1}$	−0.712	−0.014	−0.795	−0.005
	(−1.29)	(−0.64)	(−1.35)	(−0.21)
$DUAL_{t/t-1}$	0.032	−0.005	0.014	−0.005
	(0.87)	(−1.49)	(0.38)	(−1.15)
$FSHR_{t/t-1}$	0.171	−0.005	0.065	−0.011
	(1.55)	(−0.41)	(0.54)	(−0.83)
SUE_{t-1}			1.608*	0.195*
			(1.96)	(1.84)
YEAR	YES	YES	YES	YES
IND	YES	YES	YES	YES
Adjusted R^2	0.1883	0.0196	0.1997	0.0208
N	988	1055	787	851

The values in brackets are *t*-statistics after the White heteroscedasticity adjustment. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

Model (3).[21] The control variables are all delayed by one period to avoid look-ahead bias (Pang et al., 2020). Unless ROE-induced dividends completely fool the market, the coefficient $γ_3$ on the interaction term should be significantly negative. However, as shown in Column (2), the coefficient of *PAYOUT×ASMISS* is not significant, suggesting that investors fail to recognise managers' incentive for manipulating ROE immediately and thus underestimate the negative value impacts of ROE-induced dividends.

Columns (3) and (4) further control for the concurrent unanticipated earnings surprise (SUE; calculated based on the random walk model) and derive similar findings. In sum, investors cannot distinguish ROE-induced dividends from the normal dividend payouts; therefore, ROE-induced dividends are associated with lower future returns. The findings in Table 10 suggest that both investors and regulators should be cautious about these incentive-distorted dividends.

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[21]When examining the short-window cumulative abnormal returns (*CAR*), our results are fairly robust to alternative variable constructions. The results are unaffected if we compute *CAR* by adjusting the value weighted market return, by the CAPM model, or if we use [−2, +2] as the event window. The corresponding results are untabulated but are available upon readers' request.

8. Conclusions

Due to regulators' persistent advocacies, companies' willingness to pay dividends and the proportion of dividend payers have increased significantly over the years. It has also become a widely accepted notion that companies reward investors by dividends. However, managers can also use dividends to manipulate ROE. This paper explores this possibility by looking at the weighted average ROE requirement used in performance-vesting equity incentive plans. We find that companies with pre-dividend ROE slightly below the ROE target are more likely to pay out dividends and are associated with larger payout ratios. Because earlier dividends have greater effects on the weighted average ROE, we further find that such companies are also more likely to issue dividends earlier. These findings indicate that both the amount and the timing of dividends are taken into account by managers with strong incentives to meet ROE targets. We rule out spurious correlation through falsification tests and obtain similar findings by ex-post target meeting measures. In further analysis, we detect a substitution effect between dividends and traditional earnings management tools. Finally, we conclude that ROE-induced dividends are value-destroying.

   Our paper has important implications. First, we advise regulators to be cautious about ROE-induced dividends and consider how best to apply ROE in regulatory policies (especially policies for refinancing where ROE and dividends are both required). Second, investors should be aware that dividends may be issued for reasons other than rewarding investors; Payouts such as ROE-induced dividends could be harmful to firm value. Finally, in terms of the design of equity incentive plans (especially vesting requirements), our paper implies that short-term vesting targets could intensify managers' myopia. Therefore, we advise directors and compensation committee members to set long-term vesting requirements or use relative performance evaluation in equity incentive plans to mitigate managers' incentives to manipulate performance.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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